

*INCREASING NURSES' USE OF FEEDBACK TO PROMOTE
INFECTION-CONTROL PRACTICES IN A HEAD-INJURY
TREATMENT CENTER*

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This study established regular implementation of a simple feedback procedure by supervisory nurses with their assistants at a head-injury treatment center. Five nurses were trained to distribute brief written comments to their assistants about infection-control practices, including using gloves to avoid contact with body fluids. Following low rates of written feedback, nurses met with the trainer weekly to set goals for using the system, to review feedback rates, and to examine contingent letters of appreciation. Written feedback increased from 0.09 to 0.58 per day. When outcome data on glove use were subsequently added to the feedback provided to nurses, nurses' feedback on glove use increased and overall glove use by assistants increased by 36.7% for 66.7% of assistants who responded to feedback. Assistants rated feedback as highly accurate and indicated some interest in receiving future feedback. However, nurses and assistants expressed a preference for oral over written feedback.

DESCRIPTORS: supervisor implementation, feedback, infection control, AIDS

Feedback has been demonstrated to improve staff performance in health-related programs (DeVries, Burnette, & Redmon, 1991; Geller, Eason, Phillips, & Pierson, 1980; Mayer, Dubbert, Miller, Burkett, & Chapman, 1986), presumably because feedback supports naturally occurring contingencies. The challenge of establishing a feedback system implemented entirely by supervisors, however, might be difficult in a demanding job situation. Accurate job performance in human service settings rarely produces a tangible product. Thus, the qual-

ity of job performance can be fleeting and difficult to detect. Therefore, for supervisors to provide feedback on staff performance, supervisors must be present in the work area and vigilant to staff performance of targeted job skills.

Research has frequently found that simply telling supervisors about the value of feedback or training them to institute a feedback package is inadequate (e.g., Cossairt, Hall, & Hopkins, 1973; Maher, 1981-1982; Roffers, Cooper, & Sultanoff, 1988). Natural contingencies often fail to support supervisory feedback about ongoing performance. For example, supervisors may overlook nursing assistants' infection-control practices in favor of other direct patient-care activities. Yet, from a public health perspective, infection control is vitally important ("Overview," 1987; "Update," 1988).

In the present study, nurses serving as supervisors were responsible for staff's adherence to existing infection-control policies. Following training on new written feedback procedures, nurses rarely implemented the feedback program. Feedback and recognition were then provided to nurses on their use

This study was part of a dissertation conducted by the first author in the psychology department of the University of Massachusetts at Amherst. Support for the purchase of forms used in the study was provided by the psychology department. The authors appreciate the assistance of the administrators and staff at the facility at which the study was conducted. Portions of the study were previously presented at the convention of the Association for Behavior Analysis in Milwaukee (1989) and the Berkshire Association for Behavior Analysis and Therapy in Amherst (1989).

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of feedback. This study analyzed the influence of that support strategy on the supervisors' implementation of written feedback and on their assistants' job practices.

METHOD

Participants

Five nurses and 12 nursing assistants participated voluntarily. Three additional nurses and 7 assistants were lost from the study through staff turnover. One of the 3 nurses who left the facility did so following training in the use of the written feedback procedure. In addition, 3 assistants withdrew from the study while remaining employed at the facility (2 before and 1 at the beginning of the feedback condition). The latter stated that she did not wish to receive written feedback from nurses.

All except 2 of the nursing assistants were female. The nurses' ages ranged from 20 to 59 years, and all had previous hospital experience. The assistants' ages ranged from 20 to 29 years, and all had at least 6 months of experience at the facility. Nurses supervised assistants and performed skilled patient care. Assistants provided some nursing care and completed daily patient care.

Setting

The study was conducted in a private, 42-bed, acute head-injury treatment program. Nurses routinely instructed personnel to adhere to the policy of using gloves to avoid contact with all body fluids when interacting with patients and carrying soiled linen.

Research Personnel

The trainer and one research assistant conducted observations. Training and feedback to nurses were provided by the senior author, and the assistant remained uninformed. The trainer coded all inventory records, and a second uninformed research assistant collected interrater agreement data using the coding system. All research personnel were students and not employed at the facility; however, the facility's program director served on the trainer's dissertation committee and facilitated acceptance of the overall goal of the study by the organization.

Materials

Feedback from nurses to assistants was written on a form with carbonless duplicate sheets. Items included (a) the infection-control practice used or omitted, (b) the rationale for the desired practice, (c) the best feature of the observed performance, and (d) any suggestions, as well as the date, time, place, and assistant's identity.

Dependent Variables

The numbers of feedback slips used were determined by counting slips returned to a locked box located at the nurses' station. Observations of these permanent products were conducted approximately four times per week during all phases. Written statements were classified as positive (i.e., compliments) if performances were rated as fully correct; they were considered suggestions if they included one or more words in a space labeled "Next time try . . ." or critical statements if incorrect performances were noted with no suggested alternatives. Feedback episodes were not observed directly.

The total number of gloves used on the unit was obtained from coding inventory records kept by nurses. The total number of gloves used on the unit was counted or judged to be unknown for each week using a coding scheme that yielded 91.7% interobserver agreement over 12 weekly periods.

The use of gloves to carry soiled linen out of semiprivate rooms was directly observed. Thirty-minute observations were conducted in facility hallways using 1-min intervals at fixed times, four times per week on first and second shifts. Interval-by-interval agreement indices over 36 joint observations yielded 84.6% and 88.0% agreement for occurrences of glove use and nonuse, respectively, to transport soiled linen.

Experimental Design

A multiple baseline across subjects design was used to analyze the impact of the interventions with nurses. The sequence of interventions was the same for all nurses.

Procedure

Baseline. During baseline, observers noted the use of gloves by assistants. A red sign announcing

the need for blood and body-fluid precautions was posted at one patient's door by the infection-control nurse. Staff members were informed that they must strictly follow universal precautions with this patient due to an ambiguous result on an initial test for the human immunodeficiency virus (HIV).

Training. The trainer provided 20 to 50 min of training to each nurse on how to provide written feedback. Conforming to a present outline, the trainer stressed the importance of using specific positive feedback and occasionally suggesting strategies to comply with infection-control policies. These included "universal precautions" and "soiled linen" policies requiring staff to use gloves to avoid all contact with any body fluids. Nurses were told that a good suggestion describes exactly how a task should be implemented and provides a specific rationale for the suggested alternative. Nurses practiced providing the feedback in three simulated situations and classified audiotaped statements as instances of praise, suggestions, or criticisms. They were given copies of the feedback forms and asked to try to complete a minimum of one slip per workday. Following training, the trainer periodically asked nurses whether they had an adequate number of forms available, but no feedback was provided about the nurses' use of forms.

Process only. The trainer met with each nurse individually and described plans to begin providing weekly feedback and letters recognizing their efforts in distributing written feedback slips. Nurses were shown a graph of their shift's progress toward the goal suggested in training (using at least one feedback slip per nurse per workday) and a cumulative record of their individual use of written feedback slips. The trainer explained each graph and assured the nurse that her own data would remain private, unless she agreed to allow the trainer to send her supervisor specific copies of congratulatory letters she received contingent on her own accomplishment of weekly goals or her contribution toward her shift's accomplishment of weekly goals. The trainer also explained that the administrators had been told that the forwarding of all congratulatory letters was voluntary and that, due to the nature of the design, the absence of a letter for any nurse in any week provided no information about performance.

The trainer met initially with the charge nurse for the shift and, based on previous data, negotiated a challenging but attainable initial weekly goal for each shift (30% for Shift A, at 22.31% above current performance; 25% for Shift B, at 25% above current performance) and a long-term goal of completing 0.8 to 1.0 feedback slips per day (80% to 100% of the initial goal) over a 3-week period. After the charge nurse agreed to the initial and the long-term goals, the trainer met with the other nurses and presented the goals as set for the shift. The trainer informed nurses that, when the long-term goal was met, the facility would provide a reception for nurses and assistants involved in the project.

In subsequent individual weekly meetings, the trainer reviewed each nurse's and her shift's progress toward meeting the previous week's goals. When goals were met, the trainer provided and offered to distribute congratulatory letters. Based on the schedule and the shift's previous performance, new goals were suggested and the number of feedback slips the nurse needed to complete to meet her individual goal was discussed.

Outcome and process. Added to the components of the previous condition, grouped observational data on nursing assistants' glove use were presented in weekly feedback meetings. These data included the percentage of times linen was carried with gloves and the number of feedback statements completed by nurses about the glove use. The trainer pointed out any apparent changes in nursing assistants' performance that might be related to the nurses' use of the feedback forms.

Consumer satisfaction. Three weeks after the study ended, all nurses and assistants who participated were asked to complete consumer satisfaction surveys anonymously. Three weeks later, survey results were presented at a reception for participants.

RESULTS

Figure 1 depicts the number of written feedback forms provided by nurses to their assistants. Average daily numbers ranged from 0.0 to 0.25 per nurse, with a mean per nurse of 0.09 during the

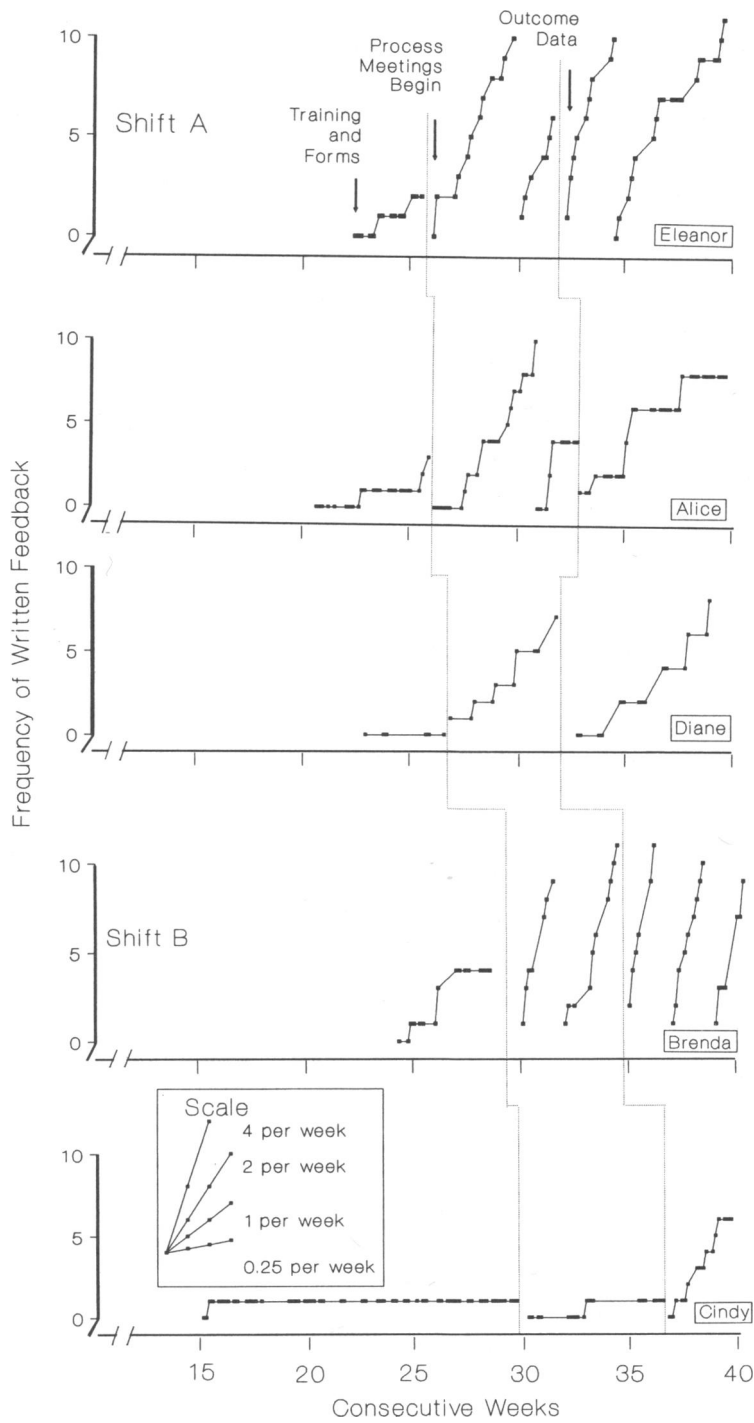


Figure 1. The cumulative number of written feedback statements provided to assistants by nurses. Training and Forms = training nurses in use of written feedback; Process Meetings = goal setting, feedback on supervision provided by shift and individual, and letters of recognition; Outcome Data = same as process meetings, plus feedback to nurses on results.

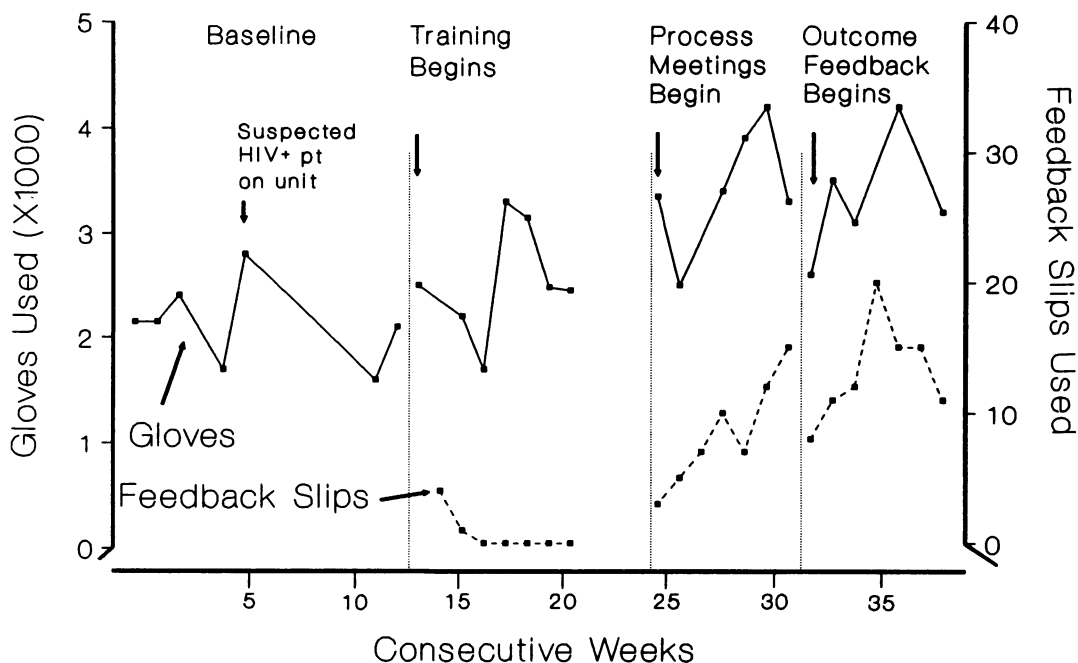


Figure 2. Overall number of gloves used on unit per week during baseline and intervention conditions, and total number of written feedback statements provided by nurses following training.

training condition. In the process-only condition, the number of written feedback slips completed by nurses increased to an average of 0.58 per day, with a range of 0.06 to 1.18. For Eleanor, Alice, Diane, and Brenda, outcome feedback resulted in 0.67 slips per day (range, 0.25 to 1.26) compared with a mean of 0.69 in the process-only condition (range, 0.42 to 1.18). Cindy increased her rates of written feedback from 0.06 to 0.33 with outcome feedback.

In terms of content of nurses' written feedback, the median overall percentage of positive statements made by individual nurses was 83.3% (ranging from 68% to 100% for individual nurses). Only 14 of the total of 141 slips (9.9%) identified inadequate performance. Seven (5%) included an entry written in the "Next time try . . ." section, and seven (5%) identified a deficit without offering a suggestion. One nurse provided compliments twice (1.4%) to an assistant who demonstrated improvements following previous corrective feedback.

All nurses' feedback statements related to infection-control practices; however, during the training

and process-only conditions, only 10 of 67 (14.9%) slips specifically mentioned carrying soiled linen as a reason for using gloves. Following the introduction of outcome feedback, 34 of 74 (45.9%) slips specifically mentioned the use of gloves with linen, and 4 of the 5 subjects increased the percentage of their feedback statements that targeted this performance.

Figure 2 presents data from inventory records reflecting overall glove use by all employees during baseline and the gradual introduction of each experimental condition. The average number of gloves used during baseline was 2,100 (range, 1,600 to 2,800), with the greatest use of gloves in Week 6 when staff were informed that a patient on the floor may have tested positive for HIV. In Weeks 12 and 13, following the death of this patient, glove use decreased, hinting that the baseline increase was specific to precautions used with this individual.

To display the relation between the two variables, the combined number of written feedback statements made by all nurses on the unit is also presented in Figure 2 along the right y axis. During

weeks 15 to 38, when the frequency of written feedback statements gradually increased, the number of gloves used per week correlated significantly ($r = .65$, $p < .01$, $df = 15$) with the number of feedback slips completed. On average, 3,300 gloves per week (range, 2,600 to 4,200) were used in Weeks 31 through 38, when the outcome feedback condition was sequentially implemented across all nurses. The data during this period did not overlap with the range prior to the beginning of written feedback (Week 15), except during Week 6.

Observations of glove use in transporting soiled linen revealed some improvements between the last five trials before and after assistants received nurses' feedback. Six assistants increased their glove use by an average of 36.7% after receiving an average of six feedback statements (range, 2 to 13 statements). Two other assistants who did not use gloves also received little feedback (one or two statements), whereas 1 assistant who always used gloves received nine feedback statements.

Assistants returned eight consumer satisfaction surveys at the end of the study. They categorized written feedback as very enjoyable ($n = 2$), somewhat enjoyable ($n = 1$), neutral ($n = 4$), or somewhat annoying ($n = 1$); and as very helpful ($n = 2$), somewhat helpful ($n = 3$), neutral ($n = 2$), or somewhat distracting ($n = 1$). In addition they rated the nurses' comments as always ($n = 4$), or usually ($n = 3$) accurate. Most assistants indicated a preference for oral feedback only ($n = 5$), over oral and written ($n = 2$) or no feedback ($n = 1$). Further, most assistants ($n = 5$) indicated no desire to continue receiving written feedback from nurses. However, 7 respondents expressed some interest in receiving feedback about performance areas other than infection control.

Seven supervisors who participated in all or part of the study returned questionnaires. They indicated that completing feedback forms was no extra ($n = 2$), a little ($n = 2$), some ($n = 2$), or a great deal ($n = 1$) of effort and that observing performances was no extra ($n = 1$), a little ($n = 1$), some ($n = 2$), quite a bit ($n = 2$), or a great deal ($n = 1$) of effort. None of the nurses rated giving the written feedback forms as very or somewhat enjoyable, and

4 rated this aspect as neutral, 1 as somewhat, and 2 as very unenjoyable. Most indicated a preference for giving oral only ($n = 5$), instead of oral and written feedback ($n = 2$) or no feedback ($n = 0$). Written feedback forms and letters of acknowledgment for nurses were rated as the least helpful aspects of the study (means of 2.71 each on a scale of 1, very unhelpful, to 5, very helpful), whereas more favorable overall ratings were given for training nurses in using the system (4.0), weekly meetings with the trainer (3.86), seeing data on precaution use (3.86) and on their own use of the system (3.57), and weekly goals (3.43).

DISCUSSION

Only when the trainer began to supply feedback and letters of recognition did the supervisors begin to dispense frequent feedback to their assistants. This is consistent with findings of previous studies demonstrating that antecedents alone may not establish desired rates of preventive practice (e.g., Geller *et al.*, 1980; Komaki, Collins, & Penn, 1982). Simply training and providing nurses with feedback forms were inadequate to establish that supervisory practice. Perhaps the time required to observe and complete the written forms was sufficiently aversive to eclipse any uncertain, delayed reinforcement in the form of their assistants' improvement in adherence to the glove-wearing policy.

Assistants' responses to feedback interactions also may have been aversive to nurses. This conjecture is supported by nurses' and assistants' expressed preference for oral rather than written feedback. Additionally, although invited to continue at the end of the study, 4 nurses stopped making written feedback statements immediately and 1 made only two additional statements. Whether it would have been as difficult to establish routine oral feedback remains unknown (and evidence of each occurrence of feedback would have been lost for research purposes).

The strong positive correlation between statements completed by nurses and total gloves used on the unit reflects several additional nurse-medi-

ated supports for improved infection-control practices. Four of the nurses commented that their participation improved their own adherence to infection-control precautions, consistent with previous findings about the beneficial effects of participation in training on competence (e.g., Jones, Fremouw, & Carples, 1977). Such improvements also may have served a modeling function for other staff members. Assessment of changes in the infection-control practices of feedback providers may be an area worthy of further study. Similarly, the selection of the most important infection-control practices to target in a feedback intervention warrants further study (Finney, 1991).

Alternatives to situations in which the persistence of a management system depends upon the involvement of an outsider, such as a consultant or a researcher, should be explored. Including the senior administrator as an integral player within the program is one especially promising technique. In such cases, the administrator might establish a routine of periodically recognizing supervisors' and their assistants' improved performance. In the current case, considerable effort was needed to obtain and review data on nurses' supervision and assistants' performance. Tying both performance measurement and performance improvements to management or incentive plans is an additional strategy that deserves further analysis.

REFERENCES

- Cossairt, A., Hall, R., & Hopkins, B. (1973). The effects of experimenter's instructions, feedback, and praise on teacher praise and student attending behavior. *Journal of Applied Behavior Analysis*, 6, 89-100.
- DeVries, J., Burnette, M., & Redmon, W. (1991). AIDS prevention: Improving nurses' compliance with glove wearing through performance feedback. *Journal of Applied Behavior Analysis*, 24, 705-711.
- Finney, J. (1991). Selection of target behaviors and interventions: A case of necessary but insufficient choices. *Journal of Applied Behavior Analysis*, 24, 713-715.
- Geller, E., Eason, S., Phillips, J., & Pierson, M. (1980). Interventions to improve sanitation during food preparation. *Journal of Organizational Behavior Management*, 2, 229-241.
- Jones, F., Fremouw, W., & Carples, S. (1977). Pyramid training of elementary school teachers to use a classroom management "skill package." *Journal of Applied Behavior Analysis*, 10, 239-253.
- Komaki, J., Collins, R., & Penn, P. (1982). The role of performance antecedents and consequences in work motivation. *Journal of Applied Psychology*, 3, 334-340.
- Maher, C. (1981-1982). Performance feedback to improve the planning and evaluation of instructional programs. *Journal of Organizational Behavior Management*, 3, 33-40.
- Mayer, J., Dubbert, P., Miller, M., Burkett, P., & Chapman, S. (1986). Increasing handwashing in an intensive care unit. *Infection Control*, 7, 259-262.
- Overview of new guidelines: CDC recommendations for prevention of nosocomial HIV transmission. (1987, August 24). *CDC AIDS Weekly*, pp. 3-5.
- Roffers, T., Cooper, B., & Sultanoff, S. (1988). Can counselor trainees apply their skills in actual clinical interviews? *Journal of Counseling and Development*, 66, 385-388.
- Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood borne pathogens in health-care settings. (1988). *Morbidity and Mortality Weekly Report*, 37(24), 377-388.

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